Time Utilization of the Electronic Health Record within General Surgery Residency

Duke Surgery

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INTRODUCTION

- Utilization of electronic health record (EHR) is essential in the daily activities of resident and faculty physicians
- EHRs are constantly used within academic medical centers for documentation, as a source of information, to report relevant facts, and also for displaying data in tabular or graphical form
- The amount of time spent by physicians utilizing the EHR has not been thoroughly quantified and evaluated, especially within surgical specialties

OBJECTIVES

- Analyze the EHR usage general surgery residents at Duke University over the course of an academic year.
- Report time utilization estimates and overall global trend of the EHR usage
- Identify the relationship between EHR utilization time and operative case logs

METHODS

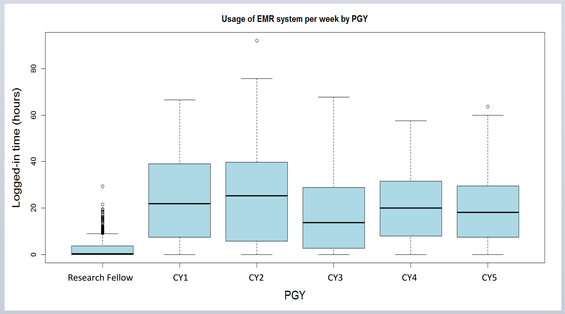
- **Data Source:**
  - Duke Performance Services
  - De-identified login and logout time data from Epic EHR (Verona, WI)
- **Inclusion Criteria:**
  - ACGME general surgery residents
  - Preliminary and categorical interns
  - Active residents during 2016-2017 academic year
- **Statistical Analysis:**
  - Created binary time series for each resident
  - Descriptive statistics
    - PGY
    - Gender
    - Month, week, day
  - Pearson correlation coefficient between case logs and login time

RESULTS

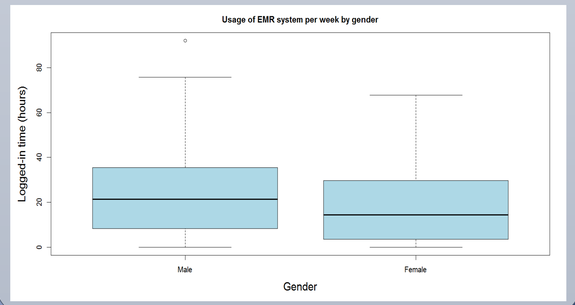
Baseline characteristics:

	Total N = 50	Male N = 36	Female N = 14	P value
Age	29.9 (±2.7)	30.6 (±2.7)	28.3 (±2.0)	0.009
Clinical PGY				0.14
Research Fellow	14 (28%)	8 (22%)	6 (43%)	
CY1	11 (22%)	8 (22%)	3 (21%)	
CY2	8 (16%)	5 (14%)	3 (21%)	
CY3	4 (8%)	2 (6%)	2 (14%)	
CY4	6 (12%)	6 (17%)	0	
CY5	7 (14%)	7 (19%)	0	
Interns				0.55
Preliminary	5 (45.5%)	3 (38%)	2 (67%)	
Categorical	6 (54.5%)	5 (62%)	1 (33%)	

General surgery residents utilized the EHR a median (IQR) of 10.8 (0.5, 28.9) hours per week with statistically significant differences based on PGY (p<0.0001):

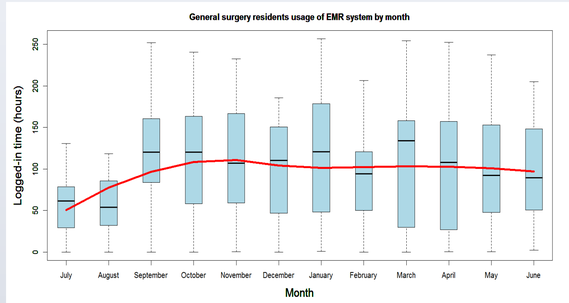


Males spent a median (IQR) of 21.4 (8.3, 35.4) hours per week utilizing the EHR compared to females with a median (IQR) of 14.4 (3.6, 29.6) (P<0.0001):

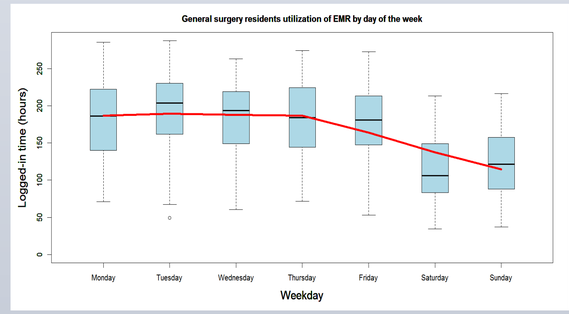


RESULTS (cont.)

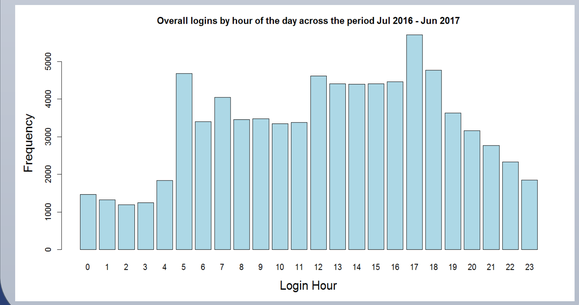
General surgery residents utilized the EHR a median (IQR) of 93.8 (44.6, 149.2) hours per month per resident. The red curve estimates the overall trend using a non-parametric regression approach:



EHR utilization by general surgery residents was statistically different based on day of the week (p<0.001) with overall median (IQR) of 4.7 (3.4, 5.8) hours per day per resident. The red curve estimates the overall trend using a non-parametric regression approach:



The frequency of EHR logons by general surgery residents is higher during daytime hours, with clinically significant peaks at 5am and 5pm (resident shift change)

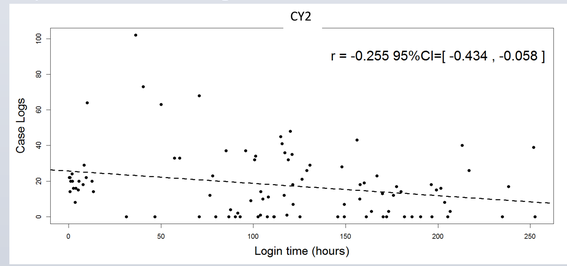


RESULTS (cont.)

Case log correlation:

PGY	Correlation	95% CI	P value
CY1	0.270	0.041, 0.472	0.021
CY2	-0.255	-0.434, -0.058	0.012
CY3	0.112	-0.177, 0.384	0.446
CY4	0.409	0.196, 0.585	0.0003
CY5	0.149	-0.067, 0.352	0.176
Overall	0.008	-0.093, 0.110	0.872

Only the CY2s had the hypothesized negative correlation between monthly EHR login time and case logs. The line represents a linear regression curve:



CONCLUSION

- At 16.5 hours per week, general surgery residents spend a substantial portion of the maximum 80-hour work week utilizing the EHR
- EHR usage is highest during day time hours with peak login times at 5am and 5pm
- There was not an overall negative correlation between EHR time and case logs

FUTURE DIRECTIONS

- Further analysis of EHR utilization after hours for day and night shifts
- Conduct a similar analysis for general surgery faculty
- Correlate these quantitative results to physician burnout and patient outcomes
- Implement programs to improve efficiency and decrease burden of charting

Disclosures: none

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